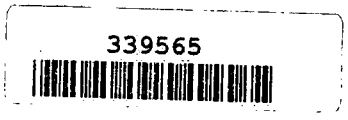
4.0 HEALTH AND SAFETY



4.1 General

CECOS Environmental, Inc. is aware of the health and safety hazard potential of the compounds which may be encountered during project work at the Duane Marine Site. Potential employee exposure through inhalation, skin absorption, and/or ingestion are valid concerns which will be addressed and minimized throughout project duration.

All CECOS employees involved with this project work will be thoroughly educated and trained as to the hazards of these materials and requirements for personal protective equipment, personal hygiene, personnel and area air monitoring, and the health surveillance program.

It is only through the proper implementation and maintenance of such programs that maximum employee health and safety protection can be assured. This is a corporate policy which governs all aspects of CECOS' operations.

4.2 Personal Protective Clothing

4.2.1 General

This section outlines the minimum personal protective equipment requirements for all remedial work as described in the bid specifications.

These requirements represent the initial protective equipment requirements which, upon review of site conditions and analytical results may be revised after consultation with the Contractor On-Site Coordinator (OSC).

4.2.2 Project Work

For the purpose of prescribing the minimum personal protective equipment requirements for all project work associated with the Duane Marine Site, operations have been

defined accordingly; Liquid Sampling, Solid Sampling, Bulk Consolidation, and Liquid Handling. Personal protective equipment requirements for each operation are defined as follows:

4.2.2.A Liquid Sampling

NIOSH/MSHA - approved full face, pressure demand, supplied air respirator
Tyvek/P.E. disposal coveralls
Work Clothing
Neoprene rubber gloves over latex rubber gloves
Rubber boots
Work boots (steel toe and shank)

4.2.2.B Solid Sampling

Same as (4.2.2.A)

4.2.2.C Bulk Consolidation

NIOSH/MSHA - approved half face respirator equipped with organic vapor/acid gas cartridges equipped with a dust/mist prefilter
Tyvek/P.E. disposal coveralls
Work Clothing
Neoprene rubber gloves over latex rubber gloves
Rubber boots
Work boots (steel toe and shank)

4.2.2.D Liquid Handling*

Same as (4.2.2.C) plus a full face shield or equivalent full face respirator.

* The protection factors of respiratory protection may be increased dependent on the results of materials sampling.

4.0 HEALTH AND SAFETY

4.3 Safety Equipment

Additional safety equipment may be required for specific projects. This equipment may include, but is not limited to the following:

A. Two-way, intrinsically safe, radio communicators
B. Portable personnel drenching stations
C. ABC portable fire extinguishers

4.4 Air Monitoring

4.4.1 Personnel Monitoring

Employee exposure to airborne concentrations of materials will be evaluated periodically throughout the project work. Sampling and analysis will be consistent with the methodologies recognized by the National Institute for Occupational Safety and Health.

Based on the results of this sampling, alterations in respiratory protective equipment requirements may occur in accordance with guidelines and protection factors as presented in Table 1.

4.4.2 Additional Monitoring

Direct reading instrumentation will be available to determine instantaneous airborne concentrations of contaminants. This instrumentation will include a minimum of one of the following:

A. Organic vapor analyzer
B. Photoionization detector

4.0 HEALTH AND SAFETY

Table 1

Protection Factors (P.F.)*

Respirator	Protection Factor
I. Particulate Filter Respirators	
Powered air-purifying respirator with a high-efficiency particulate filter.	1,000
High-efficiency particulate filter respirator with a full facepiece.	50
High-efficiency particulate respirator without a full facepiece.	10
Any other dust, mist, or fume respirator except single use and quarter-mask respirators.	10
Single use and quarter mask respirators.	5
II. Chemical Cartridge and Gas Masks	
Powered air-purifying respirator with chemical cartridge.	1,000
Gas mask with chin style or front- or back-mounted canister.	50
Chemical cartridge respirator with a full facepiece.	50

4.0 HEALTH AND SAFETY

Table 1

Protection Factors (P.F.)*
(Continued)

	Respirator	Protection Factor
	Chemical cartridge respirator without a full facepiece.	10
III.	Combination Particulate and Gas/Vapor Air Purifying	
	Powered air-purifying respirator with chemical cartridge and high efficiency particulate filter.	1,000
	Gas mask with chin style or front- or back-mounted canister and filter.	50
	Chemical cartridge respirator with a full facepiece, chemical cartridge, and filter.	50
	Chemical cartridge respirator without a full facepiece, and with a chemical cartridge and filter.	10
IV.	Supplied-air Respirators	
	Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode, or with full facepiece, helmet, or hood operated in continuous flow mode.	2,000

4.0 HEALTH AND SAFETY

Table 1

Protection Factors (P.F.)*
(Continued)

Respirator	Protection Factor
Type C supplied air respirator without full facepiece, helmet or hood, operated in pressure-demand or other positive pressure or continuous flow mode.	1,000
Supplied-air respirator with a full facepiece helmet, or hood not operated in positive pressure or continuous flow mode.	50
Any other supplied air respirator.	10
V. Self-contained Breathing Apparatus	
Combination respirator including a Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure or continuous flow mode and an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.	10,000+
Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.	10,000+

4.0 HEALTH AND SAFETY

Table 1

Protection Factors (P.F.)*
(Continued)

Respirator	Protection Factor
Self-contained breathing apparatus with a full facepiece operated in demand node.	50
Self-contained breathing apparatus without a full facepiece.	10

* Allows calculation of maximum use concentrations for particular respirator types which will provide adequate health protection to equipment users, (i.e., (PEL) x (P.F.) = maximum use concentrations.) For a complete discussion of protection factors, see "A Guide to Industrial Respiratory Protection," NIOSH Pub. NO. 76-189. Protection factors are used by NIOSH in developing guidelines.

4.0 HEALTH AND SAFETY

4.5 Health Surveillance Program

All CECOS employees participate in a comprehensive, computerized, health surveillance program. Each employee is given a pre-employment, annual, and termination medical evaluation. Dependent on specific work assignments, additional evaluations and specific biological monitoring may be performed. The health surveillance program is under the direction and review of the Corporate Medical Director.

The medical evaluation consists of the following:

- Comprehensive Health and Exposure History
- Physical Evaluation
- Urinalysis
- SMA-12 (with serum enzymes)
- Chest X-ray
- Lumbar X-ray (2 views)
- Pulmonary Function Testing
- Audiometry
- Vision Testing (distant, near, color)

Additionally, each CECOS employee is evaluated to determine if they are physically able to perform work while using respiratory protective equipment in compliance with 29 CFR Part 1910.134 and ANSI Z88.2 - 1969.

All on-site subcontractor personnel (excluding truck drivers) will be subject to the same medical surveillance program as CECOS employees.

During the course of proposed project work, medical services will be established locally in the event such services become necessary.

4.0 HEALTH AND SAFETY

4.6 Personal Hygiene Requirements

4.6.1 General

The following personal hygiene practices will be enforced to prevent any unnecessary exposure to materials associated with project work. As such, they are to be strictly adhered to by all personnel entering areas potentially contaminated with these materials. These practices are necessary as part of the overall program of providing maximum personnel health and safety protection. The Health and Safety Specialist and the CECOS Project Supervisor, will be responsible for this enforcement.

4.6.2 Eating, Drinking and Smoking

All smoking materials will be stored in the area provided for the employees' personal articles. Smoking activities will be restricted to designated clean areas. Eating and drinking will be restricted to designated clean areas.

4.6.3 Decontamination

Decontamination procedures are to be strictly adhered to. These procedures are necessary to prevent contamination spread. Under no circumstances will personnel be permitted to leave the site with clothing suspected of being contaminated with materials associated with project work.

All contaminated clothing and personnel protective equipment are to be placed in the containers provided at the decontamination area. This ares has been established immediately inside the site entrance gate.

All personnel will be required to wash hands, arms and face thoroughly for breaks, lunch, and site departure in the decontamination trailer

4.0 HEALTH AND SAFETY

Under no circumstances will personnel use site areas, other than the toilet facilities provided, for such purposes.

4.7 Health and Safety Education and Training Program

All CECOS operational employees participate in routine health and safety education and training programs. These programs, directed by the CECOS Manager, Occupational Health and Safety Programs, are designed to provide these employers with a thorough knowledge of hazardous materials health and safety hazard potentials and compliance with federal OSHA and EPA requirements. As a minimum, this training includes the following:

A. Selection, use, and maintenance of respiratory protection equipment
B. Selection, use, and maintenance of personal protection equipment
C. Toxicology
D. Confined space entry
E. Health and safety considerations of hazardous materials
F. Personal hygiene
G. Factors influencing chemical reaction rates
H. Labeling and placarding

A collection of Material Safety Data Sheets has been located on-site and is available to all personnel.

The Project Supervisor will conduct weekly "tool box" safety meetings throughour project owrk. Subkects to be covered will include the following:

MSDS Review
Equipment Operation
Heat Stress
Safe Handling of Solvents
Miscellaneous Topics

4.0 HEALTH AND SAFETY

4.8 Emergency Communication

Two-way radio communication will be established and maintained with field crews working in the exclusion zone.

4.9 Spill Prevention

The CECOS spill prevention plan includes the diking/berming of all storage of contaminated liquids and/or fuel, the development of operating procedures with spill prevention designed in, and the training of employees in spill prevention and control techniques.

In the event of accidental spillage, the following flexible spill response will be implemented:

A. First aid will be administered to injured/contaminated persons. Any CECOS employee observing a spill will act immediately to remove and/or protect injured/contaminated persons from any life-threatening situation. First aid and/or decontamination procedures will be implemented as appropriate.

B. Warn unsuspecting persons/vehicles of the hazard. CECOS personnel will act to prevent any unsuspecting persons from coming in contact with spilled materials by alerting other nearby persons and by obtaining assistance of other CECOS personnel who are familiar with spill control and cleanup techniques.

C. Stop the spill at the source, if possible. Without taking unnecessary risks, CECOS personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum closing a valve or temporarily sealing a hole with a plug. CECOS personnel will not expend more than a brief effort prior to notifying the CECOS Project Supervisor.

4.0 HEALTH AND SAFETY

D. Notify the CECOS Project Supervisor. Utilizing available personal radio communications or other rapid communication procedures, the CECOS Project Supervisor will be notified of the spill, including information on material spilled, quantity, personnel injuries, and immediate life-threatening hazards.

E. Spill assessment and primary containment. The CECOS Project Supervisor will make a rapid assessment of the spill and direct primary containment measures. Depending upon the nature of the spill, primary containment measures may include, but are not limited to:

- Construction of a temporary containment berm utilizing on-site clay absorbant earth.
- Digging a sump, installing a polyethylene liner and diverting the spilled material to the sump.
- Placing drums under the leak to collect the spilling material before it flows over the ground.
- Transferring the material from its original container to another container.

F. Notify the NJ DEP Project Manager. The CECOS Project Supervisor will notify the OSC of the spill and steps taken to institute primary containment.

G. Spill cleanup procedures. The CECOS Project Supervisor will develop a spill cleanup procedure taking into consideration associated hazards, quantity of spilled material, disposal methods and costs. The spill cleanup plan will be reviewed for acceptance by the OSC.

H. Spill cleanup. CECOS personnel will clean up all spills following the spill cleanup plan developed by the CECOS Project Supervisor. The CECOS Project Supervisor will

supervise the spill cleanup. Equipment, materials and supplies necessary to clean up a spill may already be immediately available on-site. Such items may include, but are not limited to: front-end loader, shovels, rakes, clay absorbant, polyethylene, personal safety equipment, steel drums, pumps and miscellaneous hand tools.

I. Spill cleanup inspection. The OSC and CECOS Supervisor will jointly inspect the spill site to determine that the spill has been cleaned up to the satisfaction of the OSC. If necessary, soil, water or air samples may be taken and analyzed to demonstrate the effectiveness of the spill cleanup effort.

4.10 Contingency Plans

The following contingency plans will be enacted in the event of personnel injuries and/or fire.

A. Personal Injuries

1. Initial alarm and first aid. Upon observation of an injury, quickly get attention of other nearby workers. Immediately act to protect the injured person from a life-threatening situation. Render appropriate first aid. Warn unsuspecting persons of the potential hazard.
2. Notify CECOS' Project Supervisor and the OSC. Utilizing available personal radio communications or other rapid method, notify the project managers or their representatives of the situation. Identify the injured person, the type of injury, and the project site location.

3. Ambulance and hospital services. The CECOS Project Supervisor or his representative will immediately assess the situation and, if necessary, notify the designated ambulance service and hospital of the emergency situation.

4.0 HEALTH AND SAFETY

4. Follow-up. The CECOS Project Supervisor will determine why the injury occurred and will take appropriate steps to prevent a similar recurrence. Events associated with the injury will be recorded in the CECOS Project Supervisor's logbook.

B. Fire

1. Initial alarm. Upon observation of any on-scene fire, immediately notify both project managers or their designated representatives. No attempt will be made to extinguish the fire prior to sounding the alarm.

2. Control and/or extinguish fire. Without risking personal injury, attempt to control or extinguish the fire utilizing available ABC-type fire extinguishers or clean burrow material. Do not use water except on wood or paper fires.

3. Notify local fire company. The CECOS Project Supervisor will immediately assess the situation and notify the Fire Department of the location and type of fire. If necessary, either Project Manager may order the site evacuated until the fire is controlled or extinguished.

4. Follow-up. The CECOS Project Supervisor will determine the cause of the fire and take appropriate steps to prevent a similar recurrence. Events associated with the fire will be recorded in the Project Supervisor's logbook.